

AVIATION WEEK

DEC. 1, 1947

INCORPORATING AVIATION AND AVIATION NEWS

A MCGRAW-HILL PUBLICATION

Sentinels of Peace



"A just and lasting peace among ourselves and with all nations" . . . that was the goal which Abraham Lincoln set for his countrymen eighty-two years ago. It is the goal toward which we are striving today—more earnestly than ever before. Though the ideal may seem far short of attainment, lasting peace throughout the world represents the hope and

aspiration of men of good will everywhere. Winged through the skies on friendly missions, America's planes are reminders of the might which must ever be the bulwark of permanent peace. Our air fleet has helped to make this country strong; if we are to continue invincible, we must maintain it. Only a powerful America can remain a peaceful America.

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AIR TRANSPORTS could not develop their present power and safety cover their vast distances without sodium-cooled valves. Since Thompson first manufactured the sodium-cooled valve, constant research has produced new valve needs and methods, and aircraft valve life has steadily multiplied from the few flying hours of these decades ago to the many thousands of hours recorded by Thompson Aircraft Valves in regular operation today.

A Thompson Sodium-Cooled Aircraft Valve, so simple-looking in its perfect contour and finish, represents many engineering achievements in design, chemistry, metallurgy and production.

Hundreds of extreme precision operations of forging, machining, heat-treating and inspection go into each valve before the final result is ready for its vital responsibility.

That's why safety-minded aircraft engine builders and airline operators use Thompson Sodium-Cooled Valves so universally.

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Valves for Aircraft and Automotive Industries, Manufacturers of
Valves, Builders of Valves, Blades and Assemblies for Jet and Turbo Propulsion Engines



It takes a 2375-gallon drink upstairs without spilling a drop

EXPLOITING THE COLossal STRENGTH of a new giant airplane called for a special system of fuel cells—2375 gallons!

The task was to build a cell that big which would be leak-proof and self-sealing, would withstand shock and the stress of shaking fuel, and would have minimum weight.

War-paved B. F. Goodrich fuel cell engineers, together with special housing designed by B. F. Goodrich engineers, turned out to be the ideal answer. The 300 square foot cell was actually lighter than the plane manufacturers called for. And in AN tests

a single cell proved highly successful in withstanding the effects of pressure, heat, negative pressure, vibration, vibration and pressure.

The remarkable performance of this B. F. Goodrich self-sealing fuel cell results from its sandwich construction. An inner layer of rubber keeps the structure firm, vital to the potency of aviation fuel, severely impacted. Two layers of natural rubber swell on contact with the gasoline prevent leakage in case of puncture. And rayon cord plies provide strength and abrasion resistance.

This cell carries 2375 gallons of fuel aloft, through rapid altitude

changes and fast maneuvers, without losing a drop. Other self-sealing fuel cells and bladder-type cells are produced by B. F. Goodrich on for all types of planes. These fuel cells are a good example of how B. F. Goodrich keeps pace with the needs of the aviation industry. B. F. Goodrich is constantly working to make planes cost better, the way to a better future. The B. F. Goodrich Company, 1000 Broadway, New York 10, N. Y.

P



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AVIATION WEEK, December 2, 1947

THE AVIATION WEEK

CLINIC SUMUP.—While far too early to make any definite, long-term assessment of the success or failure of the revamped National Aviation Clinic, those who attended the forty-year year's meetings in Oklahoma City and this latest one in Springfield, Ill., are giving a consensus approval to the new procedure and its potential for future years.

It was to be expected that with a change in scenery and method of operating, this year's Clinic would be different. It was, and a preliminary assessment would be that the differences were on the credit side.

The improvement was by large stemmed from the unseasonal procedure and street legislative format of the Clinic. There were fewer and better speeches. With most discussion limited to floor debate, delegates had a far greater opportunity than in former years to have their fall say.

For the first time, in the minds of any present, this was an "unconventional" Clinic in the sense that there was not the usual feeling of an underground machine pulling strings, either in directing the agenda or the voting.

NEW ATMOSPHERE.—This created a new atmosphere that was among the clinic's most marked features. There were groups with special issues to plead, but they were many and small so that there was no balance of Power. Rather, was independent thinking and voting. Delegates for the first time, perhaps, were voting for what a majority thought would help aviation in general, and not one segment in particular.

This situation was salutary not alone for the delegates. In frequent terms, it generated interest, yet thought-out criticism. And because of that entrance value of the criticism, it had a valuable byproduct.

Criticism of CAA and overregulation, for example, was frequent. But far in answer in debate were substantial testimony of Commerce John Allen, CAA Administrator T. P. Wright and their associates. This was true of all government representatives. To their credit, they made the most of their opportunity, in a reasoned, cooperative manner.

Deprived of the consolation and protection of a desk in a well-appointed government office in Washington, these men for perhaps the first time in a public session responded so ably to criticism that they made friends.

Allen and Wright and their opposite numbers in other government departments have known, of course, the temper of the industry. This has not always been true of some of their assistants. The impression the Clinic debates made on these latter gentlemen hardly can be other than encouraging.

This development would have been even more noteworthy had there been among the delegates members of CAB.

DEBITS.—Too—in striving to draw up a balance sheet of the Clinic, an observer would have to note offset to the credits. The quality of the attendance might be rated as disappointing. Excitement of the manufacturing industry and of large airlines were fewer than the session seemed to call for. One result of this showed in the voting.

Scheduled airlines lost out on the airframe issue and on several minor matters. Feeder lines, well represented, won everything they proposed.

Also on the debit side—although this is natural—is the fact that the machinery was still too new to be thoroughly effective in all particulars. One of the great values of the Clinic is in a means of getting the state of aviation across to the public. In previous years, the Clinic has been an ideal vehicle for this purpose, attracting media industry leaders and a sizeable press corps, the job of which was simplified and made efficient because the many proposed speeches could be distributed in ample time to secure landing.

Reporting a legislative session is a different type of operation. The Clinic, consequently, did not receive the general press coverage it had in former years. To the extent that this diminished public interest in and awareness of aviation's problems, it was a weakness in an otherwise generally excellent formula.

FUTURE.—That formula, in practice, showed careful planning and laying of groundwork. The rules committee worked hard and opinion is general that it did a fine job in weeding the numerous bills of policy from cockpit and propaganda offerings. While it had much open to criticism that it stifled controversial subjects, there was always recourse in the permissible procedure of introducing bills on the floor.

The actual legislative machinery was well groomed, as was shown by a microphotograph and printing setup that put before each delegate copies of bills or major amendments before or during debate.

This was the hardest working clinic that aviation has yet seen. The rules committee sat until past midnight at least one night; a lightning trip was cancelled so delegates could get in an extra session on the floor. Normal sessions began at 10.30 in the morning and ran until 5.30 in the evening.

Whether all this work will result in a strengthened, strengthened Clinic is still to be determined by the National Aeronautics Association. On the basis of reactions to date, it appears probable that the next annual National Aviation Clinic will be a more effective one than those of the past. The one that has recently been held in Springfield, Ill., was a better year than those that have been held before.

ALLEN

ANNOUNCES

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NEWS DIGEST

DOMESTIC

President Truman accepted the resignation of General Robert M. Littlejohn as administrator of the War Assets Administration effective Nov. 28. Truman praised him for his "ability, tact and discretion" in carrying out his job since July, 1946.

Henry P. Nelson, wartime head of War Production Board aircraft division, was elected president of Menasco Manufacturing Co., Burbank, Calif. He formerly was vice president and eastern manager for Nomac.

George E. Lusk, vice president and treasurer of Lockheed Aviation, Inc., Burbank, N. Y., was named to the National Council of the Committee for the Marshall Plan to Aid European Recovery.

FINANCIAL

Consolidated Value Aircraft Corp. reports net loss of \$6,384,773 for the nine-month period ending Aug. 31. After giving effect to its tax credit of \$18,890,721. Sales for the period amounted to \$51,464,578 and backlog now stands at \$195,513,423. Company board voted new representatives of Aero Manufacturing Corp. thereby assuming management control of the company.

United Aircraft Corp. reports net income of \$8,881,285 on sales of \$144,084,578 for the first nine months of the year. Directors declared a 75-cent dividend on Nov. 15 payable Dec. 15, bringing to 51 the total dividend for the year. Backlog to Oct. 1 was \$275,080,300.

Harold Corp., Los Angeles aircraft disassembling firm, reports a net loss to surplus of \$39,461.70 for the first nine months of its current fiscal year.

Alco-Chalmers Manufacturing Co. reports net income of \$1,913,562 equivalent to 76 cents per share, for the third quarter. Dividends for the period were \$142,516,216 and current backlog is \$168,800,746.

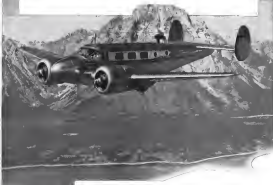
FOREIGN

Purchase of five Lockheed Constellation for civilian service of Garuda Indonesia Airlines has been proposed to the government by the air department of the ministry of transport of Papua. The contract intends to use them on a new Papua New Guinea operation.

Freight charges on all goods transiting Australia are likely to be reduced upward following the 20 percent increase in passenger fares last month. Tariff increases not blamed on rising operating costs.

On the Beechcraft Executive Transport

Safety Glass BY "PITTSBURGH"



Windshields of Duplate Safety Plate Glass are standard equipment on Beechcraft Model D18S — another example of the industry-wide reliance on "Pittsburgh" glasses for airplanes.

MANY important advances in airplane design have been made possible by special glasses, plastics, and glass-and-plastic combinations developed by Pittsburgh. And as the aviation industry continues its phenomenal

progress, there will be other "Pittsburgh" products to meet its demands. Continued research and expansion, state-of-the-art manufacturing equipment, years of experience in glass-making — these are your assurance of highest quality glass and up-to-date glazing techniques.

When you have new problems concerning airplane glass or glazing, write to Pittsburgh Plate Glass Company, Room 3120-7, Grant Building, Pittsburgh, Pennsylvania.



"Pittsburgh" stands for Quality Glass and Plastic

PITTSBURGH PLATE GLASS COMPANY

SPECIALISTS IN AIRPLANE GLASS — MAKERS OF DUPATE AND 1
 AND OF MULTIPLE LAMINATE-RESISTING GLASS

1	2	3	4	5		
6	7	<h1>Exide</h1> <h2>FLIES THE AIRWAYS WITH THESE FAMOUS EMBLEMS</h2> <p><i>(How many can you identify? See below.)</i></p> <p>Each of the leading airline companies, represented by the trade marks shown here, use Exide Air Transport Batteries. Exides have long been the preferred batteries for airline service because they are built specifically to meet ALL its storage battery needs . . . extra capacity, minimum weight, long life, dependable performance under all flying conditions.</p> <p>Whatever your storage battery problems, Exide engineers will be glad to help you solve them.</p> <p>THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 <i>Belle Routes of Canada, United, Western</i></p>			8	9
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12	13	14	15	16		
17	18	19	20	21		
22	23	24	25	26		

1 American Airlines, Inc. (Dom. Int.)
 2 American Overseas Airlines, Inc. (Dom. Int.)
 3 Boeing International Airlines, Inc. (Dom. Int.)
 4 Delta Air Lines, Inc. (Dom. Int.)
 5 Eastern Airlines, Inc. (Dom. Int.)
 6 Trans World Airlines (Dom. and Int.)
 7 United Airlines, Inc. (Dom. Int.)
 8 Northwest Airlines, Inc. (Dom. Int.)
 9 Chicago and Southern Air Lines, Inc. (Dom. Int.)
 10 Western Airlines, Inc. (Dom. Int.)
 11 Delta Air Lines (Dom. Int.)
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NEWS SIDELIGHTS

REVISED PROCUREMENT

Watch for radical changes in Air Force procurement policies. Secretary Spengler has issued at it several times. First is, double-breasted responsibility is proceeding under Air Force General Counsel Shaw, to simplify legal rules in private contract language and procedures, and by Undersecretary Barnes, includes Rusk's provision, dealing with actual procurement and military law-enforcing problems. Barnes has a staff of special advisors from business and industry.

Spengler is equipped with stability of professional Air Force officers to enable with the heavy problems of procurement.

Plus is to train new flying leaders and procurement experts in the Air Force, used by civilian consultants, and have tactics and strategy in the by.

UNDECIDED ON CAF

What House members undecided on a measure to fill the Republics in capacity at CAF, according to a secret letter received from the President by Oregon's GOP Senator Mike Foster. Foster's GOP Senator Mike Foster. Foster's GOP Senator Mike Foster.

Gov. Wallinga of Washington, Chief of the House, proposed Lee W. Foster, president Seattle state station owner. Foster's GOP Senator Mike Foster. Foster's GOP Senator Mike Foster.

LUKE OF THE FLYING CAR

Don't count out the Ford Packard in the auto transport race. Though lacking the graceful silhouette of the sportsman, the flying beauty is still the only designed-for-the-purpose air fighter in production, and its estimated seven cubic ton rule operating cost appeals strongly to the independent cargo carrier.

Now the top 500 Airway approached the Air Force on possibility of becoming three Packards for a 90-day trial program to determine its detailed costs and utility. Later, California Trans made a similar report. Air Force so-

lused, claiming it could not spare so many ships for so long a time. But the Packard did offer to lease one Packard for 30 days of the cargo lines loaded together and jointly distributed costs and shared results. So far, there is no news of a reply by the Independent Airway. Already in quantity production (125) under contract the Packard could sell consistently for cheaper than any other new plane now under consideration. Even more price saving than the Packard is Foster's upcoming detailed cargo machine which would cut airplane ground loading time to the few minutes required to attach the containers to the first fitting-procedure.

The container itself could be adapted to trucks, railroad flat cars at simple towing at a trailer.

BREWSTER HOLDS OFF

Owen Brewster continues broke head of Seattle War Investigating Committee, but Sen. Ferguson is the deciding force, despite his title of Chairman, "Senate War Investigating Subcommittee."

Since hearings suspended, after last session's Hughes quit, Brewster has maintained a "hard-off" policy toward the committee and has attended only one minor hearing, on transportation (Ferguson's recent handling of the Mexican case has caused the committee's critics among senators of both parties.

FISKY LIGHTER THAN AIR

President campaign in some quarters for government aid for light-than-air construction has kept the subject on the agenda for discussion among government aviation officials of subcommittee. If the two air policy boards now deliberating how things down, how over, further development of dirigibles will be ordered seriously.

DRYDEN STEPS IN

Dr. Hugh L. Dryden, new NACA director of research, has effectively delayed early production of a professional attitude toward his administration of the 6,000-man research agency. Taking the news carefully from the available Dr. George W. Lewis, Dryden made an extensive tour of all NACA installations and received visiting programs and

programs with a critical eye. Otherwise how report he has gone into actual quality. (1) He brought into Washington from the laboratories top-notch research specialists, and placed them in administrative posts, replacing predominantly clerical personnel. (2) He is strengthening technical committees and subcommittees, and strengthening their procedures on the basis of his 20-year experience as a subcommittee member. (3) He is taking a more aggressive stand as appreciation accounts to prevent over changes by Congress. But NACA has not in the past asked for as much money as it thought it really needed. The 1949 NACA budget request is expected to be considerably higher than ever before.

CAF CUTS BACKLOG

For the first time since April, CAF in October made progress against its mountainous backlog of dockets. Pending cases dropped from 1,206 in Sept. 30 to 1,154 in Oct. 31. Big reason is that new court applications have been pending since last month up to three years. Applicants draw up five bonds and asked for discounts without hearing.

AIRMAIL RATE QUIZ

That House Post Office Subcommittee led by Edward Rees, Kenneth Reebolton, expects to launch hearings the first week in December in its recognition of airmail rates and payments.

Rees has suggested that airmail postage go to seven cents in weight, and that "cost plus reasonable profit" payments to airlines for mail be organized from "airmail" payments. This would fully reveal government aid, he claims. The subcommittee says it wants to know how all concerned parties.

MORE MAIL PAY HIKES

Airline companies maintain they have not expenses as deeply as safety permits. Significant needs have been accomplished in slowing operating costs. But weight and material have been increasing. There is a need for more money. There is a need for more money. There is a need for more money.



Artist's impression of McDonnell XP-55 "parasite fighter" reveals hand-shaped fuselage and "fly lead," probably retractable for connecting Canoe to B-36A belly tractor. Old combine form of tail section is one of many tested to provide stability for the tractor fighter. Note wing built as wing, which has negative dihedral, a fuselage mounted in high-gate wing, wing doors. Canoe has no landing gear—can be launched and retrieved aboard "mother" plane.

Parasite Jet Fighter Due for Test

McDonnell jet strives to solve unusual design problems as appendage of B-36 bomber.

U. S. Air Force's latest new "parasite fighter," the McDonnell XP-55, is scheduled for completion and test flight in the next few weeks at the company's Leavenworth, Kansas airport plant. Plan is launch it from the belly of a modified Boeing B-36 Superfortress, then bring on Canoe B-36A, available for the experiment. Since the fig. 21-

ton fighter has no landing gear it is carried with a "hugable hook," run air to base and on Canoe FVC-1 Source-Bell fighters on the Aloha and Marion diagrams.

Original experimental contract for two XP-55 flight articles and a static test plane has been augmented to 15 for service tests. B-36A's will be available for extensive testing, turning coincident with the delivery of the production P-55. The test unit, that of which can fit into a B-36A bomb-bay.



Small, new fighter was developed for parasite operations with Canoe B-36A and extending down fuselage with the long fighter was shown up into the aircraft. Note: Main, from long wheel and new structure (center) who prevented the side development of old Superfortress during an early test flight.

has a span of 23 ft. and is only 15 ft. long. Wings fold for storage within the bomb-bay and are spread outside on the launching "trapezoid."

► **Speed 650 Mph.**—Powered by a single Westinghouse 24C mid-flow turbojet engine of 3,000 lb. static thrust, the hand-shaped fighter has a top speed of better than 650 mph with a radius of operation at 45,000-ft. altitude. A major feature is a tremendous rate of climb, considerably greater than any current fighter. Armed with four 50-cal. machine guns, the P-55 extends the range and hitting power of the B-36A defense armament tremendously over the bomber's eight two-20mm. turret.

Reduced in every detail, the design of the P-55 posed complex problems of stability and control, particularly on full configuration. An extremely short fuselage and swept-back wings aggravate the stability problem, to a point where it may not be completely solved until flight tests provide the best design.

► **Thorough Tests.**—New Air Force contract for service test quantity of the P-55 makes the unique call a thorough wrapping out at the Leavenworth Air Base. Command test pilots and instructors are feverishly determined to exhaust the potentialities of the "parasite fighter" as a new tactical concept in long-range bomber defense armament. However, there are strong indications that the idea is slated for eventual abandonment.

Gen. George C. Kenner, commandant in chief, U. S. Air Force Strategic Air Command, who will direct the test-out development and equipment of the B-36A, is doubtful of the value of the parasite fighter because of difficulties of retrieving the planes after their initial mission of kill is said. (Aviation Week, Aug. 15).

It would, however, be the bomber which does down to "bitch out" a speed fighter in its go-around.

It would be difficult for a fighter pilot to find the "mother" plane, which he had originally left and if he looked up to another he would be taking the place of another parasite.

With three fighters aboard the B-36A there is little of any space left for the storage of bombs.

New Aero Lab

The University of Minnesota will build a new mechanical-aerodynamic tunnel building within the next 15 months to cost \$2,100,000. One day will be large enough to accommodate a complete airplane. A helicopter landing platform and a meteorological laboratory will be constructed on the site. The experimental wing will include a high altitude testing laboratory in which conditions for high altitude flight can be reproduced.

Air Force Strips Medals, Pay From Meyers, Plans Court Martial

Justice Department directs grand jury investigation of former Wright Field officer's affairs; income tax probe also under way as result of Senate hearings.

Senate War Investigating Subcommittee's action will be heard during the next session of the war activities of Maj. C. Bennett E. Meyers had work, opened the way for major new developments stemming from the investigation. These were:

► (1) Investigations by the Justice Department, Internal Revenue Bureau, and War Department, pointing to possession of the former deputy chief of Army Air Force communications group, Air Force General, Gen. Clark directed an immediate grand jury probe of Meyers, who later possible charges carrying a total sentence penalty of 39 years imprisonment and \$29,300 in fines and costs, including, possibly, \$110,000 fine and 10 years imprisonment, perjury, \$2,000 fine and five years imprisonment, subornation (procuring witnesses to falsify oral testimony), \$1,000 fine and five years, bribery, extortion, \$500 and one year, conspiracy to defraud, \$30,000 and ten years, income tax evasion, \$5,000 and five years on each count. There may still be charges of blackmail and extortion of a criminal code barring prosecution officials from dealing with firms with which they held stock as government representatives.

Secretary of the Air Force Benjamin Douglas said that Meyers had been stripped of his war time medals and was a retired Air Force officer and that the Air Force would court martial

Meyers on charges of "conduct unbecoming an officer" regarding the seizure of the civil action against him. Symington indicated that any additional charges against Meyers that are not dealt with in a civil court will be included in the Air Force court martial.

Meyers holds the Distinguished Service Medal and Legion of Merit—highest awards for distinguished service and collect retirement pay of \$570 a month. Symington admitted that there was some question regarding the legality of the Air Force action but said that no action against him to be in the position of forcing Meyers to take legal action to attempt to recover either his medals or pay. Symington and the Air Force was determined that Meyers would not take another dollar from the United States Treasury.

► (2) Justice Department opened its own probe charges last summer by Special Assistant Howard Hughes and Sen. Owen Brewster (R., Me.), chairman of the Senate War Investigating Committee. Hughes charged that Brewster, at the behest of few American newspapers, attempted to cover up the charges of an Air Force with PAA under the threat of an investigation of his wartime flying loss and commitment plane crashes. During the investigation, Hughes charged that a higher attorney (Hugh Pollock) attempted to pressure him into ending

the inquiry. A death of evidence, it appears, will make charges difficult to sufficiently substantiate for legal action. It is understood that Justice is covering possible failure of PAA, an attempt, engaged in lobbying activities to register with the clerk of the House of Representatives, as reported under the 1946 Congressional Reorganization Act.

► (3) War Investigating Subcommittee, headed by Sen. Owen Brewster (R., Me.), launched into new investigations of wartime prosecution, including "side issues" developed from the Meyers investigation, and studies looking to possible revisions in military procedure. A recommendation by the subcommittee that the military establishment investigation agencies be separated from the chain of command appears sound in view of the mass of evidence indicating a tendency of command to cover its own action.

► **Arnold Testimony.**—Testimony by H. H. (Happy) Arnold, referring to Meyers as a "bitter apple," whose "gross misconduct" has "damaged his mission and his unit" and reflected "on the three million men and women who served in the Air Force" damaged the faith in the Meyers hearings.

The climax of Arnold's appearance was his declaration of "efficiency and discipline" to "Meyers' allegations that he (Arnold) knew of and condoned Meyers' misdoings in aviation form, according to over 155,000.

After opening on a questionnaire, ordered by Arnold, that his total aviation staff holdings were 200 shares of General Electric. Meyers related, he actually advised Arnold of his 335,000 additional aviation holdings in the possession of being transferred to his wife's account under her maiden name, and Rose Caldwell. Arnold's response, according to Meyers, was "Thank you, God."



Northrop Pioneer, "backyard industry" business economically short taken by getting airborne in 100 ft. With 100 hp per sq. ft. of wing, it can fly 100 mph at full gross weight at 21,000 ft. The new version has all at 100 ft. with 100 hp per sq. ft. of wing.

NORTHROP PIONEER

TAKES OFF SHORT

It goes up and comes 100 ft. in 100 ft. with 100 hp per sq. ft. of wing, it can fly 100 mph at full gross weight at 21,000 ft. The new version has all at 100 ft. with 100 hp per sq. ft. of wing.

ENGINEERING & PRODUCTION

Odium Heads Convoir In Management Shift

New chairman, nine month financial report, point to continued Lister production.

Delightful but oblique assurances that Consolidated Value Aircraft Corp. will continue manufacture and sales of its Convoir Lister are seen in the statement of Floyd B. Odium in his recent chairmanship of the company, and in a non-committal financial report released conservatively by releasing chairman Irving S. Balcock.

The stock prospectus issued at the time the proposal was advanced to transfer control of Convoir from Aero to Atlas Corp. cast strong doubts upon the continuance of the Lister project by saying the Convoir fund year shortly preceding. When the transfer became official and Odium took over his new post last fortnight, he declared:

"Heavy losses (on the Lister) have been incurred during the year ensuing to a close and further substantial losses during 1948 seem almost a certainty. The Convoir Lister should be an enterprise as serious of the country's aviation as any Spring."

Inventory Wayne-O-Balcock's financial report showed a writing off of \$14,000,000 worth-in-process machines on the Lister and allocation to raised surplus account of a \$18,000,000 post-war reserve. The only assets specifically

mentioned about the possible dropping of the Lister project was because the fiscal year just ended was Convoir's last chance to carry back current losses against wartime (1945) profits. Instead, Convoir is wiping all part of its loss through the carry-back device by writing off a good portion of the Lister investments. This makes unnecessary the carrying of the post-war reserve.

For the next month, Convoir lost \$6,004,773 after provisions for its carryback credits of \$15,000,000. Sales during the period totaled \$31,454,378, leaving a backlog of \$195,513,427.

In the switch of control of Convoir from Aero to Atlas, nine directors, including Balcock, resigned. Odium was George F. Allen, Victor Edwards, R. S. Pratt, Noel Dew Buckle, Forrest A. Gilroy, Randolph H. Decher, C. Gibson Darling and J. Mason Houghland.

New Directors-To replace those who were represented, Odium on the board, Atlas selected C. F. Gaudin, director and consultant of Electro Bond and Shaw, Oswald L. Johnston, of the law firm of Simpson Thacher and Bartlett, Sydney R. Ingh, vice chairman of the board of Thermo Services, Inc., George H. Shaw, of the law firm of Lee, Shaw and McCarty, Ben O. Howard, member consultant in Atlas and other firms, Richard C. Patterson, Jr., chairman of the board of Ogden Corp., William C. Rodolph, general manager of Allen P. Adams and Associates, Emmett A. McCabe, Atlas executive.

In another change, H. A. Bruno &

Associates, took over Convoir public relations from H&B and Kiewit, Inc. The Bruno firm has long represented Atlas Corp.

AIA Plane Directory Lists 49 Models

Forty-nine different models of aircraft, including four helicopters, "currently are being offered on the civil market" by 25 U. S. aircraft manufacturers, according to Aircraft Industries Association. Several of the planes included in AIA's catalogue are not yet in commercial production.

AIA's directory of last year showed 29 companies offering 47 models.

The list this year puts the number of subversive models at 17, "including two cargo drags." These are the Boeing Stearman and Panchard pocket, both of which now are being produced only for the Air Force. Among the 17 multi-engine planes is the Consolidated Value Model 77, powerplants of which are stated to be "5,000 hp. gas turbines." This is the first indication that Convoir might be engaged in development of such a craft, the XC-99—built for the Air Force and now ready for ten trials—being powered by reciprocating engines.

Included also are the Martin 3-03, and the Northrop Pioneer, four Consolidated models, three two-engine Beech models, but not the four-engine Beech Model 39.



As the drafter's pencil moves its work, he issues orders, through a remarkable kind of shorthand, to the men who must set up his drawings, but only with special assistance can human hands shape such precise, complex orders on steel. No wonder the drafterman chooses his instruments with care ... he is, in effect, taking them into partnership!

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*Fig. 2-2, Rev. 1-57

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SERVICE SET-UP AT MacARTHUR FIELD

For an airborne Lockheed Aircraft Service Unit, the 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st, 32nd, 33rd, 34th, 35th, 36th, 37th, 38th, 39th, 40th, 41st, 42nd, 43rd, 44th, 45th, 46th, 47th, 48th, 49th, 50th, 51st, 52nd, 53rd, 54th, 55th, 56th, 57th, 58th, 59th, 60th, 61st, 62nd, 63rd, 64th, 65th, 66th, 67th, 68th, 69th, 70th, 71st, 72nd, 73rd, 74th, 75th, 76th, 77th, 78th, 79th, 80th, 81st, 82nd, 83rd, 84th, 85th, 86th, 87th, 88th, 89th, 90th, 91st, 92nd, 93rd, 94th, 95th, 96th, 97th, 98th, 99th, 100th.



Sheet of exposed photo template production system at Boeing's Seattle plant, is automatic sensitizing machine. One sheet, per min. like at far left, is in position for sensitizing, while sheet at left has emerged from machine for transfer to the drying conveyor.

New Machine Speeds Templating

Automatic Sensitizer, Conveyor System Aid Production by Making Templates Available Shortly After Master Drawing Completed.

Installation of new equipment and adoption of new methods by the photo template unit of the Boeing Aircraft Co. in Seattle, Wash., plant has resulted in a semi-automatic operation that results in greater production with reduced manpower, and delivers finished templates ready for use in production within a few hours after the master drawing has been completed by the engineer.

The application of photography in the making of templates was adopted by Boeing before the war and devel-

oped under the impetus of wartime necessity. With a greater variety (D-17, B-24, C-57 and B-29 Superfortresses) and a relatively high level of production near the end of the war Boeing today also uses more photo templates than during the war, according to K. Prosser, the production unit supervisor.

Automatic Sensitizing—Heart of the new system is an automatic sensitizing machine, first of its kind, adjusted especially for flooding by the DeVlieg company from a smaller automatic machine used for printing semi-finished articles.

The sheet upon which the templates are photographed, generally aluminum or clear steel but sometimes plywood, is fed into the machine on an overhead conveyor capable of handling 3,000 sq. ft. of template stock every hour.

A vertically moving spray gun, with a pressure of 35 lb., begins its function as soon as the sheet enters the spray chamber. Nitrogen of the gas is fed downward with the speed of the conveyor (12 ft. a min.). A system of rollers controlling the flow of spray rendering conditions is actuated by solenoids.



Fig. 1—Sheet at automatic floor-sensitizing conveyor ready for control.



Here, sensitized sheet has been placed on back of vacuum coil of London stereophoto template camera. Tracts in front of coil are for focusing light and in photographing master drawings.



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Revere produces aluminum alloy tubes in sizes up to about 3½" O.D. and in many wall thicknesses. The alloys available are 25, 35, 45, 145, 525 and 615.

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AVIATION WEEK, December 1, 1947



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GENERAL ELECTRIC



Large plate templates are processed in vertical tank. Processing boat is shown rising about 100 ft. in tank, while behind window, there is conveyor to ready for coating.



Two tanks of infrared lamps dry glass templates in they are coated by an conveyor to final inspection area. Start of the right is being transferred automatically to overhead transfer.

coupled with turners set in motion by a tripping device as the sheet enters the machine and closed in the sheet passes the gas thus reducing wet spotting to a minimum and saving a considerable amount of material. The gas opens a strip 3 to 10 in. wide on each vertical trip over the sheet, giving a smooth 0.01 in. coat coating.

Photographic conditions and in these operations is fed from positive tanks where temperature is thermostatically maintained at approximately 140 deg. F. for proper printing conditions. In early operations, the emulsion had a tendency to cloud on the sheet but this was overcome by the addition of a small amount of hyaluronate and by using such that the printed sheets had been properly dried.

Standard sheets are coated out of the spray chamber on a conveyor and carried by an automatic turner for device by a double track conveyor capable of holding 10 sheets during the heating drying period. By the time the drying rack is filled, the sheets at the far end are dry and ready for the camera. (Overhead sheet are kept in this tank, from the tank they are moved until they are placed on the camera rack.)

► **Photography**—Master drawings made in 0.015 steel covered with an overcoat of metal, which are then photographed on the Brown Photo type camera especially designed for photo template reproduction. To assure accuracy, the negatives, infrared film, and the master drawings are mounted on a turner. In making a template, the negative is projected back on the unit, the master carefully "transferred" to scale and the exposure made on the sensitized sheet usually produced aluminum. From the camera the exposed sheet goes to the processing tank, where developing, fixing and washing takes place in vertical

tanks into which the template is lowered by means of a perforator boat.

From the wash tank, the template is transferred to a second conveyor which carries it through a final water rinse and a double tank of 144-250 watt infrared drying lamps. The spray and the lamps are actuated by photo electric cells so that both operations turn on and off automatically as the template runs along the conveyor. The light cells turn on each three lamps in quick to cover the particular width (2 to 3 ft.) being used.

Emerging from the dryer the quick-drying templates are carried by the conveyor to an overhead turn table, to which they are automatically transferred.

► **Drawing on Steel-Sheet steel** and for the master drawing is marked with grid lines, 10 in apart in each direction for the convenience of the operators. With these lines, the engineer is able to use a 12 in scale in the preparation of his drawing. Marking of the lines is done by a laser-penetrated method which consists of 137 lines mounted on a steel ruling on roller bearings along a fixed steel beam. This method glass, under a laboratory hand operation and works with tolerances of 0.01 in.

The engineers do their drawing with a silver (blue, which can make a sharper line than a pencil) and which can be copied but can't be erased. The use of silver makes photography of the drawing more difficult, but this has been solved by use of a traveling light giving a minimum of reflection.

Boeing has been making an increasing use of aluminum in templates, finding it easier to handle because of its lightness. One man can easily place a sheet of aluminum on the conveyor line, whose sheet must require 6 in. At first the dimensions were poor after being soaked, but later Bo-

eing found even better results can be achieved by leaving off the paint. The material surface goes has finished, unless possible a deeper heat and does not present the shipping problem that a painted surface offers.

A recent Boeing innovation is the use of 0.015 in. thick for design sheets. Previously, when change was desired on a template, an entirely new sheet had to be prepared. Now, the change is made on "thin steel," which is connected in place on the old template.

C-W Reports Loss For Nine Months

A net loss of \$224,473 for the three months ended Sept. 30 has brought Centra Wright Corp.'s nine-month loss to \$457,145, after adjustments for tax credits and transfer from construction reserves. For the latest three months, the credit was \$570,000, and transfer from reserves \$274,750. For the nine months, the credit was \$5,770,000, and transfer \$946,287.

While the parent company was showing these losses on Consolidated sales of \$20,141,541 and \$28,528,994 for those and nine months respectively, its engine subsidiary, Wright Aeronautical Corp., showed a profit of \$243,954 on the three months ended Sept. 30. Centra Wright's profit for the first nine months was \$107,750, and for the nine months ended Sept. 30 was \$16,871,079.

Wright profits were also up for the nine months ended Sept. 30, from \$1,712,000, and for the nine months ended Sept. 30, from \$1,712,000, and for the nine months ended Sept. 30, from \$1,712,000.

Project Squid Probes Pulsejet

Five Eastern Universities Hold Navy Research Contracts

By Robert McLaren

Because of considerations of intelligence, lightweight, dependability, and simplicity, the Navy Department is pursuing fundamental research on the pulsejet engine as a project known as "Squid," a particularly apt subproject. The project concerns a series of research contracts let by the Office of Naval Research in Feb. 1946 to five East Coast universities—Princeton, Cornell, New York University, Purdue, and Brooklyn Polytechnic Institute.

Contracts are for a two-year period and aggregate about \$7,000,000. This is an indication of a great policy commitment, headed by Dr. Hugh Scott Taylor, Dean of Princeton's Graduate School. Technical engineers in under the direction of the Bureau of Aeronautics, and Lt. Comdr. C. C. Hoffman, head of the Research Section, Power Plant Division of the Bureau's technical project office.

Five fields—Research is divided roughly into five major fields—combustion, materials, diffusion and solvent, thrust and aerodynamics. Each of these is further broken down into detailed areas of investigation. Because of the original nature of these studies, each of the universities is responsible for areas new to five of these fields.

Actually, through a previous administration complexity, Project Squid encompasses both liquid rocket and pulsejet research, and the research contracts include both problems. While it is apparent that these two types of propulsion have little in common, they were assigned the exploration to the Bureau of Ordnance during 1945 in an extreme position, with such other areas as rocket and engine being assigned to BuAer.

Last year both liquid rockets and pulsejets were transferred to BuAer as research fields and were combined into a single project.

Headline of Many Nations—"The pulsejet is gone (horribly) 'squelched'." "Internal C" engine," "burn bomb engine," "new" engine," "and tube with a fuel trap" in which valves at some

place through the valve fuel and burned it. "Losing the one" "Losing the one" "Losing the one"

process is against the check valves after the explosion has released the pressure within the engine and the cycle is repeated. This creates the unique pulsations of the engine, from which it derives its name.

Like all most successful developments, the pulsejet engine is not new, its earliest form appearing in 1686, slightly more than four years after the Wright Brothers' first flight. The present pulsejet engine was the work of Konrad and was designed to operate a turbine, the open end of the pipe being directed against the turbine blades. It operated very successfully, achieving a 1 hp from a consumption of 27 lb of fuel per hour. A simple device now developed in France by Marmonier in 1906.

Father of the modern pulsejet engine was Paul Schuett, a German consulting engineer, who conceived the possibility of the device as a pulse motor. He began work on the system in 1918 and on April 13, 1931 obtained German patent No. 578,158 for such a device. From 1931 through 1935 Schuett supported his experimental work out of his own pocket but on the latter year he attracted the interest of the German Air Ministry and in 1942 he completed his work and handed over the design to Argon Motoren GmbH in Berlin for production. Application of the Schuett engine to the German V-1 followed.

It is developed—It is a surprising to find just how close the U. S. came to perfecting a pulsejet engine late recently during the war. Dr. Fritz Zander of Aerojet Engineering Corporation, experiments with an "aspirator" device during 1943. His group was an research supported by BuAer, and considerable research work was estimated only in 1944. At the same time, Lt. W. Schubert, U. S. Naval Engineering, Experimental Station, Annapolis, Md., designed and built an aspirator engine and operated it successfully, the first to be built and run in this country. His engine, however, was tabular and operated on aspirator principles rather than the simple mechanical principles of the pulsejet engine. After the debut of the V-1 is immediately possible, both military and private good ended was in this country.

Advantages of the pulsejet engine are numerous. It is—

Simple. It comprises only a properly shaped tube, a fuel supply and a valve gear, and it does not require special heat resistant alloys or expensive machined parts.

Dependable. Control of the engine is obtained through the fuel meter, and no complex governor, injectors, or carburetors are required. A simple gas valve system is used for starting.

Light. It weighs only a fraction of the dry weight of a reciprocating or turbine engine.

Flexible. It can be operated on practically any liquid hydrocarbon and is substantially insensitive to variations in operating conditions.

Some of the advantages are a number of disadvantages, which, for many applications, outweigh the former. It is—

Coarse. Fuel consumption of the pulsejet lies just below that of the simplest engine but well above the turbine's.

Noisy. Using an explosion cycle, the pulsejet engine gives an ear-splitting "sputter."

Short-lived. Because of the simplicity and simplicity of its operation, the life of the check valve tends to be comparatively short.

Consideration of all these factors is factors a sphere of usefulness of the pulsejet engine almost exclusively in the piston aircraft, and here it shows extremely good promise. Because piston aircraft are considerable, the short life of the valve elements (1 to 2 on the V-1) is not an objection. High fuel consumption is compensated in piston craft by comparatively short duration. Naval, although allowing warning to the target, is not a significant consideration, because of lack of pilot or paratrooper.

Pulsejet Problems—There are a number of problems posed by the pulsejet engine, some of them unique and complex. First in importance is the most complete lack of theory of the system because it is an intermittent flow device with accompanying wave-like oscillations. Another contributing factor is the cushion of shock waves in the tube, introducing the whole unexplored field of supersonics into the problem. With no theory as a guide, research has been forced to follow an erratic empirical course with no compensating delay.

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Circle 16

Continued from the previous page
 action is a pulsed engine (as it does in the static and endurance tests of the engine), there is a "back-flow" phenomenon maintained by a flow of air into the turbine following each cycle. This tendency of the turbine to "pull" through the turbine (over 1,000 mph) expands these gases to about 5 lb./sq. in. before atmospheric pressure, creating a partial vacuum in the tube.

While this flow pressure against the valves and permits a fresh charge of air to enter the core intake, it also permits the exhaust gases suddenly to change direction and flow back into the turbine. At low forward speeds such as such as occurs through the turbine in either

through the turbine, this pulse phenomenon also has pulsed engine of from 20 to 40 percent of its maximum thrust at speeds of 100-400 mph.

Progress Report—Initially, rapid engine has been made in Project Spirit, reducing its weight and fuel consumption. Thus, effective valve life has been increased from about 4 hr. to the original 7 hr. to more than 7 hr., specific fuel consumption has been decreased from 4 lb./hr./lb. of thrust to only 2.6 lb./hr./lb., thrust per unit cross-sectional area is up from 200 lb./sq. ft. to 570 lb./sq. ft., and thrust is close, reaching today from 100 to 150 percent.

The 150 engines and variants at

work on Project Spirit are also on-going study in an endeavor to the future potential of the pulsed engine, which, they state, is still in a crude, undeveloped state. Targets for Spirit at study have been fairly extremely set—on average so that gas cross-sectional area from 730 lb./sq. ft. to 800 or 900 lb./sq. ft., an increase in pressure into from 2-2.5 to 4-5, an increase in overall area/cool rate from 25 ft. to 30-40, and decrease in fuel consumption from 2.6 lb./hr./lb. to 1.5-1.6 lb./hr./lb.

These increases will be made possible in the operation of Spirit refinements, as progress in an engine side design, even better materials and more knowledge of turbine phenomena.

Methyl Bromide as Fire Extinguisher

By SCHOLER HANGS

Marine's carbonization and methyl bromide is a very effective agent in pressure fire extinguishing action, right up to the burning of U.S. aircraft in that "Navy" YB-49 jet wing bomber has been equipped with a main plane methyl bromide system.

Lockheed's Combsboro Division carries a methyl bromide system, and prior installations had been made by Northrop in the F-4B Black Widow and by Martin in the B-57D Maul.

Yet, despite interest that will be considered in use of methyl bromide in the YB-49, experts in the field of aircraft fire extinguishing in this country doubt strongly that this will be any immediate departure from U.S. use phase of carbon dioxide (CO₂) systems, especially in conventional aircraft.

► **Too Toxic**—They reason that toxicity of methyl bromide, and residual extreme care required in its handling will preclude any "hand" toward its general use, even though specialized spraying in weight are involved in methyl bromide systems in large planes such as the YB-49, Combsboro, and Maul.

Weight comparisons between the two systems vary with the use of the airplane and stage from estimates at 40 percent saving in weight for a big plane methyl bromide system, as compared with a CO₂ installation, to 15-20% weight saving for a DC-3.

While specific weight gain by use of methyl bromide over in engineering estimates, Navy believes that a saving of at least 2,000 lb. has been accomplished by designing a methyl bromide extinguisher system for the YB-49.

The company estimates that 33 percent extra CO₂ had been required to do the work of 100 lb. of methyl bromide carried in the system, or 340 lb. of CO₂.

► **Saving Weight**—The major weight saving lies in the fact that the methyl bromide unit is a low pressure system, its flow reduced by a local of nitrogen carried in the extinguishing agent container and comparatively light weight—less than a quarter. Also, CO₂ containers are heavy at comparison with the light cylinders of methyl bromide.

► **YB-49 methyl bromide unit** is a low pressure system, its flow reduced by a local of nitrogen carried in the extinguishing agent container and comparatively light weight—less than a quarter. Also, CO₂ containers are heavy at comparison with the light cylinders of methyl bromide.

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the case of a very complex 8,000 lb. CO₂ system designed especially for the first XB-35 wing bomber. In the XB-35 extinguisher system the largest stainless steel piping unit measures 1 in. internal diameter with an .049 in. wall thickness.

The weight penalty involved in the first XB-35 system doubtless influenced Northrop's interest in methyl bromide, and subsequent units of the XB-35 were equipped with installations for the latter, provided by Alcoa's La France Corp. The latest installation, in the YB-49, was produced for Northrop by Walter Kelle & Co.

► **No Injuries**—Despite weight economy, and standard use of methyl bromide by British's Combsboro Co., there was one extinguisher company has had no reports to date in installing U.S. commercial engine failures, or injuries, in its use.

Chief reason for this seems to be the health hazard involved, and limitation of its use in engine areas, and with such safeguards that methyl bromide fumes cannot enter areas occupied either by passengers or crew. This would dictate the use of continuous and piping in wing and fuselage areas having limited access as compared with the way to reach installations of CO₂ bottles in the nose and tail of the DC-3.

► **Precautions**—There exists considerable dispute in the interest of precautions that should be exercised in handling the poisonous chemical whose ill effects are often deadly in as much as 100 minutes after exposure.

Weight Field, in its specification No. 40950, states that methyl bromide containers be marked "Poison."

There does exist, though, a general agreement upon toxic qualities in the chemical and potential danger in that a workman might be exposed to exposure to a gas leak, or hazardous leakage.

Northrop engineers, while recognizing the hazards of the extinguishing agent, do not seem to feel that it will offer any serious problem of handling or maintenance of the extinguisher system. For one thing, discharge of the system will be isolated to the YB-49's right engine with which in themselves are far removed from the flight crew's pressurized cabin. Also, the engine's pressure gauges are such that immediate warning of a leak is provided, and in that event the engine area can be closed off, work on the leak is corrected.

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TURBINE TEST AREA contains two compressors (left) and single combustion chamber (right of turbine) which can be connected to supply hot gas to test turbine. Output is measured by water loads (left).



COMPRESSOR SETUP Dynamometer pulleys in foreground drive test compressor. Subhead at left is vacuum fan; permanent test leads to segregated control zone.



CONTROL ROOM provides quiet, protected area for test engineers, who can view operations through closed-circuit cameras, communicate with test area by public-address system, control operations manually.



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Complete and flexible test facilities for turbojet components are valuable guide for future designs.

Today—little more than 50 years after a cold, steel-tube-turbine engine was used to capacity a \$5,000,000 systems gas-turbine development laboratory is equaled by any other private facility.

This continuous probing into the characteristics of power plant components yields the design know-how needed to meet the demand for ever better military engines and helps assure the commercial utilization of aircraft gas turbines.

The job of designing and building for the Navy a completely new engine, began the day after Pearl Harbor, was completed successfully without recourse to attack and development facilities other than those Westinghouse had when war began. But late in '41 it became evident that larger facilities were essential to successful realization of the "miracles of the postwar power plant. Plans, under Bureau of Aeronautics sponsorship, Westinghouse agreed to design, erect, equip, and operate a component development laboratory.

Today, the emphasis on component testing, while the responsibility remains the government, "costs only \$100,000 a year. It is not an expense, it is a fact of life. It is the only way to develop a new engine successfully.

Scrutiny to efficiency and performance of each. Analysis of a complete plant is difficult because of the effects each unit has on the others, and because of the accurate compact layout. Thus, development testing of individual components proves the only economical solution.

In addition to turbine, compressor, and accessories, the power plant component laboratory, control and test facilities appearing, gas starters, gas analyzers, and ignition equipment. Systemic investigation of the secondary components—the accessories—includes no special problems but testing of turbines, compressors, and combustors requires heavy power and heat inputs and fast payouts. With due consideration for these factors, the laboratory was built to handle full-scale tests for power plants of up to 4000 hp net output.

This does not represent a judgment of engine size limits but typifies a balance between a large engine and reasonable engine drive of materials and manpower to achieve results.

Availability of space from a power-house built in 1940 for a new expanded marine propulsion equipment shop dictated both location of the lab and type of drive. As built, the lab comprises four major test facilities: (1) High-power

turbine; (2) high-power compressor; (3) low-power model and variable pressure combustion; and (4) engine accessories, instrumentation, and mechanical development testing.

High-power test area can take by-side fan, turbine testing, two test stages and drive shaft speed range. Steam-turbine driven compressors can be operated individually or in series with interconnecting to supply up to 50 lbs./sec. of air at pressures up to 115 psia. A compressor, capable of releasing up to 85,000,000 Btu/hr., heats this air to provide gas to operate the turbine at pressures up to 8 atmospheres and 1800 deg. F. Turbine output, which may reach 18,000 hp at 15,000 rpm, is absorbed by specially designed water tanks.

Compressors to be tested are driven by a controlled torque shaft speed range centrifugal steam turbine, which gives direct measurement of power input. Operation is a closed circuit, in which streamlined grid valve, shell and fixed tube cooler, and an 8-point pressure continuously monitored variable-speed centrifugal gas compressor (with respect to flow and pressure). The system can handle up to 6000 hp at 20,000 rpm, with discharge pressures up to 150 psi and inlet pressures to 90 in. Hg. In both high-power test areas, piping and service equipment is generally low

loss working floor level and special ventilation handles steel fire explosion proof sections and controls to under floor area.

In the combustion lab, three stages are available: (1) Blower ports and atmospheric pressure tests; (2) closed-circuit pressure tests using compressed air from the high-power turbine test area; and (3) altitude testing, using water compression plant in conjunction with a shaft-and-tube tester.

In the engine accessories, instrumentation, and mechanical development area, in-circuit projects on control, apparatus fuel and oil pumps, starters, ignition equipment, and bearings, etc., are assembled on bedplates equipped with dynamometers and analysis driven ranging from 2.5 to 125 hp. Twelve of these test facilities also built in station of the lab distribution system for several voltages, water, compressed air, vacuum, and fuel.

To minimize explosion and fire hazard, those of the accessory laboratories, supplied with propane, are installed in a room entirely equipped with explosion proof fittings and screens. Opening into the hazardous accessory test area is a shielded chamber where an entire complement of engine accessories can be operated over a complete range of atmospheric conditions to 75,000 ft.



MODEL TESTER, highly flexible, permits economical screening of large number of experimental designs. Streamlined chest center of shell-finished tube center, it contains all functional elements of high-capacity compressor test entry. The model tank, usually empty and is rotated above floor level in racks adjacent to high-power plant, and within secure area of turbine area.



COMBUSTION LAB contains two test stands like one shown. Control is at well at right is equipped for instrumentation and telemetry. Center of the combustion chamber, stationary, is shell-finished tube center. Fatigue tests are done at right in exposed for combustion stage.

FINANCIAL

Aircraft Dividends Run Counter To General Corporate Tendency

Difficult year characterized by curtailed cash disbursements to stockholders; Grumman outstanding exception with anticipated increase.

Aircraft companies are significantly absent from the daily lists showing extra and increased dividend payments being made by American corporations. The result, walking on the heels of the year's losses, is that the aircraft industry has been conspicuous by its relative inactivity in dividend disbursements.

The current year has been a very difficult period for the aircraft industry with many companies reporting large deficits. Losses would have been even greater were it not for the carry back tax credits. The reason for this showing as familiar and has been prominently highlighted in hearings before the President's Air Policy Commission and elsewhere. The death of new military business and the virtual disappearance of the commercial transport and high-speed markets has been a depressing influence on the industry. In a number of instances, heavy development expense on commercial transports have exceeded original pay-off periods and have proved particularly burdensome. This atmosphere is not conducive to continued dividend payments which in turn lead to dividend payments.

► Grumman Dividend Expected—Note worthy exception is Grumman Aircraft Engineering Corp. This company has already paid \$1.50 per share earlier this year. While it has not yet acted on the final payment for the year, the company was expected to pay at least another \$1.00 and possibly \$1.50, bringing total 1947 dividend disbursements to \$3.00 or \$3.50 per share. This would compare with \$2.00 per share paid in 1946 and \$1.50 disbursed in each of the five preceding years. Grumman probably will demonstrate the best earnings picture among the aircraft builders this year, all without benefit of air carry-back credits. The company earned \$7.62 per share on 500,000 shares outstanding for the first six months of 1947 with abnormal earnings projecting \$7.50 per share at the complete year's end. Most corporate extra dividend payments are currently being offset by losses (61 of the 1,000's) on the right which requires payment of "carry-over" amounts. With dividends at \$1.50,

ing previously retained a large part of its profits, Grumman may be forced to disburse at least 70 percent or more of its net earnings in the form of dividends. Financial and dividend status will be largely influenced by the nature of seasonal adjustments.

► United Income Normal—United Aircraft Corp. recently declared a dividend 75 cents per share on its new stock payable Dec. 1. This brings payments for the year to \$1.25 as 50 cents was paid in June. During 1946, only \$1.00 per common share was paid and represented a progressive reduction from the \$2.00 paid in 1945, \$1.50 each in the three preceding years and a peak of \$4.00 in 1940. The company also reported earnings of \$1.92 per common share for the nine months ended Sept. 30, 1947, compared to \$1.78 for the comparable period a year ago. The one point has a 5 percent \$300 par preferred stock, extending to the extent of 154,800 shares. Pending the question is a 125 cent dividend credit. While the United, for the maintenance of dividend payments on the preferred next year is good, so large disbursements on the common may be interpreted. It is significant that for the current year earnings the company expended \$87 million for engineering development and research, or an increase of about \$4 million for the same purpose a year ago. With its projected development of the X-46, rapid expansion, it is a normal expectation that such outside expenditures may continue at a very high rate. Moreover, carry-back tax credits will be largely available next year in which to absorb such expenditures.

Cessna Aircraft will also be in the dividend group which will pay as increased dividend this year, although a very marginal amount. The company will pay \$2 cents a share in Dec. 1, 1947, which is a share to the 15 cent per share enhancement last year. There are only 700,000 shares outstanding. **► Capital Status Improves**—A definite improvement in the capital structure of Custer-Wright Corp. will be very reassuring to the maintenance of

the \$200 annual dividend rate on the company's Class "A" stock. The disbursement of the company has added to the 500,000 shares of this stock at \$20.50 per share. This after expects Dec. 1. It is believed likely that the full amount of such dividend payment may be received. At present there are 1,186,151 shares of this stock outstanding. The company recently indicated that it has about \$60 million in assets working capital beyond the need of its immediate requirements. The projected investment would involve a capital outlay of only \$10,250,000. It may be perceived that additional funds may be sought in subsequent periods. The Class "A" stock is callable at \$40 per share and is entitled to \$2.00 per share in dividends annually. That is, \$1.50 per share has been paid this year. It is believed some believe that the other 50 cents will be paid during 1947.

► Boeing Payment—Boeing paid a dividend of \$1.00 earlier this year, the same as in 1946 and 1945. While a normal level was expected by this company for the first nine months of 1947, depending on the extent of difference during the fourth quarter, it is highly probable for the final results of the year to be converted into a profit. As income is in excess of last year's, it is probable that profitable results may be reported for that year which will permit the maintenance of dividends.

Consolidated Value paid 25 cents per share on May 15, 1947, representing its last payment for the 1947 fiscal year. The company is currently negotiating its aviation and non-aviation properties (AVIATION WEEK, Nov. 3, 1947). In view of the substantial losses caused by a 125 cent dividend credit, the division Cessna aircraft company and the new North Star, it is probable for both to appear in subsequent periods.

Boeing Aircraft paid only \$2.50 per share this year, which compared with \$7.50 disbursed during 1946. While the company declared that it anticipated a loss this year, it planned to maintain dividend payments.

The Glenn L. Martin Company was maintaining a 55-cent annual dividend rate and paid 75 cents per share early this year. However, the 2-2 and 3-3-3 program required substantial cash outlay and the company was forced to seek external assistance from the RFC and to meet all subsequent dividend payments this year.

Lockheed, North American, Republic, North Star and Republic will all pay some dividend last year but have refrained from doing so thus far this year. It will take a restoration of earnings and an improvement in financial status among the aircraft builders before any significant dividend disbursement can be anticipated in the industry.

—Selig Abraham

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AVIATION SALES & SERVICE

NATA Convention Delegates Urge Relief From CAA Regulations

Springfield meeting re-elects Beverly Howard, adds two more state members; revises dues for affiliation.

Delegates' appeals to Congress for relief from over-regulation by CAA were urged at the Springfield, Ill., meeting of National Aviation Trade Association delegates from 25 state associations.

In an action packed one-day convention preceding the fifth National Aviation Clinic, the first two speakers

• Established a new committee for closer liaison with the Veterans' Administration on GI flight school problems.

• Continued Beverly Howard, Charleston, S. C. speaker, in office as president for the second year of his two-year term, winning his re-appointment to stage.

• Admitted two additional state associations, Arkansas and Tennessee, into membership in the NATA Federation which now claims 32 state members.

• Voted to establish a \$24,000 budget for the national office for 1948, with several dues for member operators as covering minimum dues from \$150 to \$100 for state and national affiliation.

• Endorsed efforts by CAA and FAA agencies and aircraft manufacturers and manufacturers to reduce airplane noise through technical research changes, but considered any government trend toward regulations to force a decrease in airplane noise.

The important new Training Liaison Committee, headed by John Wilson, Chicago operator, who was named NATA vice president for training, also includes Morris Fendley, Iowa Manufacturer; Mel, Robert S. Northington, West St. Louis; N. C., Robert Turner, Indianapolis; John Clinch, North Platte, Neb.; Joseph Canada, New York; Miss Robert Ashburn, Alexandria, Va., and Newman Larson, Los Angeles.

• Picked as CAA-Job of crystallizing an over-the-counter policy opposing over-regulation in CAA and endorsement of new CAA actions, was turned over to the NATA leadership, steering committee headed by President Howard, and Harry Merrill, executive director.

The committee was instructed by the delegates to prepare Association recommendations for Senate revision by Congress of the Air Commerce Act for 1918, and

for clarification of regulations directly applying to operators.

Merrill also was instructed to prepare a list of the state associations, the proposed revision of Executive Regulation part 212.1C which would require every operator of any flight service for hire including charter and instruction, to file periodic reports to CAA.

Reasoning, according to the members, that it was "building an additional cost on the operator that he can't afford to pay."

Turner said it required the full-time work of two office girls to keep up with the reports in VA on his GI flight school program now, and that additional reports to SAE if made effective, would require an additional office girl.

"If we don't call a halt somewhere," Turner added, "they will be sending how much profit we should make. The government has no business sticking its nose into our affairs through economic regulations."

• Encouraged President - President Howard protested the "confusion" caused by the CAA and FAA. "It is hard to do all the things proposed by the Administrator and his staff as we would be working 90 percent for them and 10 percent for ourselves," he declared.

Wilson urged direct appeal to Congress by individual operators and state associations. "There is one way of stopping CAA," he said. "Tell Congress not to give them any money. We would be better off in this business if we had never had a CAA. They ought to be only a public relations outfit for aviation."

• Urging Regulations-Sen. Elmer Chaspey, Ill. delegate, called for a new law to entangle the regulatory burdens, while Larson warned the operators that if we go too far in eliminating federal regulations, "we are just moving establishment of 48 different sets of state aviation regulations."

GI flight operators also worried of a pending new VA policy to cut the price of improved solo time down to regular solo time. A local test case is now being prepared against a North Carolina operator Paul McMeans. From who

\$5,500 has been withheld as the difference between the solo rate and an inflated course supervised solo payments which he has already received. The action is contrary to a local VA ruling in St. Louis, it was reported, where the VA legal staff recognized the difference between supervised course and the solo rate and ordered payment of an operator there whose payments had been similarly withheld.

• Finance Proposed-NATA is preparing a set of standard accounting forms for GI flight schools, an which national VA office approval will be sought and which then may be distributed for a more uniform system of GI flight school administration.

The speakers passed a resolution endorsing the valuable role which the GI flight training program was playing in building a reserve of trained pilots for use in national defense.

Thomas Lusk, aviation program engineer, reported to NATA that aviation insurance interests had agreed to underwrite printing expense of a booklet containing an approved code of good report operating practices which will be copyrighted by NATA and distributed by it to airport operators. The code has been developed as a step toward self-regulation and endorsement of aviation insurance loans, and the emergency credit lowering of aviation insurance rates.

De. Leslie Brown, University of Illinois Association Institute Director, told NATA that the displaced VA, rising in GI flight training is college (University of Wisc. Nov. 19) was being considered by the American Council on Education and he was hopeful the elective flight course would be back to before the end of the year.

Stinson Leads Brazilian Imports

138 Stinson Voyners constituted a percent of the American planes imported by Brazil from July 1935 to Sept. 1947, according to William H. Krimm, Jr., general sales manager Stinson division, Consolidated Vultures Aircraft Corp. The group is the four-place 400V deliv-

under 5 percent of the total aircraft imported during the period.

"Greatest air volume in the world," said Krimm, "is 48 of 50 planes in the 'one' class line."

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Hartranft Scores Air Rule Proposals

Four proposed modifications of Civil Air Regulations, Part 63, were attacked by J. B. Hartranft, Jr., general manager of Aircraft Owners and Pilots Association, in testimony before the Civil Aeronautics Board recently, as detrimental to the interests of private pilots and non-scheduled airlines.

- Proposals under fire include:
- Installing a restriction 1,000 ft ceiling and 3 mile visibility minimum requirements in airport control areas.
 - Reinstating right-of-way separation regulations.
 - Reinstating regulations for crossing aircraft at angle of not less than 45 degrees.
 - Installing a restrictive line-of-sight regulation.

Hartranft cited an agreement reached at an industry panel on the proposed new regulations, which provided that all except these points would remain unchanged. However, he declared before the board, "breaking faith" with the industry agreement, and "regulating the whole lot" in which the new draft of Part 63 was conceived.

Hartranft argued that drastic and hasty changes within the U. S. under the 1,000 ft ceiling 3 mile visibility regulation "arbitrary and unreasonable," and cited a Weather Bureau booklet, "standard flying weather for the U. S.," in support of his contention. He attacked a trend to establishing large singular and non-uniform control areas in lieu of the uniformly small class rule areas originally planned. CAA is now replacing more and more singular areas to accommodate increased low approach systems at the 12 instrument landing fields now in operation, and presently at the additional 58 different landing fields being installed programs. Existing proposals, he stated, regulations should adequately protect between aircraft on conflict flights and traffic performance in critical situations, he said.

The right-of-way traffic regulations, he argued, if not followed by the airlines "immediately," he said, and he argued that there was nothing in the accident record suggesting need for either the right-of-way, or 45 degree separation, regulation.

• Criticism: "Sunbathing"—Hartranft sharply criticized official "sunbathing" of pilots by Government administrative agencies and stated a typical case of a pilot who made a forced landing due to engine failure on Harry Hudson Parkway in Manhattan. The pilot was cited by New York police to appear on criminal charges, and was fined with 10 days in prison plus a \$50 fine.

and by a \$4,000 fine to CAA. Hartranft said. After a court appearance the charges were dropped, but then the CAA repeat attorney suspended the whole case, with a letter calling for a compromise settlement of \$750 to avoid penalties for illegal violations. The CAA manager said this was typical of the methods of recent regulations which are changing up the fine print rules of the air, and hanging aviation on a string.

He also attacked the interpretation of the "line-of-sight" clause which was described in advance of promulgation as applicable when and where there was a "degree" of flight activity which was not otherwise specified in the regulations. Now, he asserted, "the legal minds of the CAA have applied the ruleless flying section in a different and conspicuous violation of the law, but have a successful in promulgating multiple charges against the pilot."

Objection to the change in the hours of darkness regulation was based on the fact that the regulation would require the installation of complete electrical systems and navigation lights in those sorts of personal planes not now so equipped.

Engine new power, most light planes make no provision for mounting generators and no provision to drive a generator. A complete installation would approximately 1 volt of the engine would be the only way such planes could power lights.

He cited the following figures, reported by engine manufacturers:

- Continental, 50,000 A-65 engines and 1,350 A-70 engines are in com-



FLYING MISSIONARIES

Pilot instruction and aircraft maintenance courses have become part of the preliminary training given by the Moody Bible Institute at Chicago, Ill., to students who will become missionaries in distant regions. The non-denominational institute offers courses in aviation, but for the flying course the students pay \$150 a flying hour to cover operating expenses at Midway Airport, near Chicago, where former Army pilot Lester M. Post is shown conducting class. Course includes 15 hours of ground instruction, emergency, repairs and 10 hours of flight instruction (Walt Wiedt photo).

me in which no provision can be made for generators to offset excessive cooling (roughly 3,000 per engine, while the company maintains its production at rate of 500-600 engines a month which are without special equipment or provision for it.

• Fuel—1,000 engines are in use without provision for generators and maintain two-thirds conversion is highly impractical.

• Loading—1,000 engines in use without provision for generating and require maintenance costing 25 percent of engine cost for conversion.

Refueling 1,000 engines, 67,161, Hartranft estimated that it would take an aggregate cost of \$18,024,000 to convert the engines into low approach switch 6,000 mph acceptable in practical conversion. This would be an additional burden that greatly against non-scheduled airports as a result of the change in the darkness regulation, he charged.

Stinson Plans 1948 Sales

Consolidated Vultee's Stinson Division has started a series of sales order meetings for dealers and others in key cities to bolster its 1948 production and promote higher sales.

General sales manager William J. Merkle Jr. stresses word for word, both new and used aircraft, service and parts department and engineering projects, with considerable savings. Specific recommendations included after of 15% decrease to price of 15% decrease in 1948.

The *NEW* Marquette
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AIR TRANSPORT

Airlines' Pilot Selection Methods Hit In CAA-Sponsored Survey

Present procedure for rating pilot performance fails to stress factors which cause critical situations leading to accidents, researchers find.

involve the skills of establishing and maintaining a proper angle of glide, rate of descent and speed at glide on the landing approach. Fisher to perform this part of the pilot's duties adequately was shown to result in three times as many accidents as failure to perform any other part of the job.

• **Development of Emergency-Airline**—Analysis of the flight phase in which 652 air-line accidents developed showed 319 critical situations during final approach and landing, 235 in climb flight, 55 during takeoff and 27 while taxiing. From interviews with 240 airline pilots, only 70 incidents involving fatigue were identified.

Of 429 unsafe conditions (hazards other than the pilot) reported as contributing to critical situations in other flying, 244 involved weather, 75 unsafe conditions of the crew (mainly errors

► **Selection Measurements**—In order to determine if online selection requires assets for pilot applicants were piloted

At the end of the 12-week training period, the two groups of applicants who were later classified as successful and unsuccessful were compared as to age, education, IQ scores, mechanical comprehension test results, personality inventory scores, previous flying hours, marital status and previous ground training in aerobics. No significant differences were discovered between the successful and unsuccessful applicants.

Data from this comparison thus indicated strongly that present selection requirements of the airlines are not critical requirements since they do not predict later success or failure during training. Advancement on this check

does predict later success or failure, but the study found that CAA inspectors commonly check pilots and systems per Federal emphasis on aspects which others contribute to critical situations.

■ **Question Pinned**—CAA inspectors and company check pilots were asked "who you check a pilot, what are the fir-

you particularly look for when you feel dissatisfied: a good airline pilot and a poor one? Of 254 specific things which they said they looked for particularly, only 74—or 24 percent—had to do with pilot behavior which was presumably found to be most vital from the standpoint of contributing to critical situations and accidents.

The four most frequently mentioned kinds of behavior which the GAA members and company check pilots looked for are types which do not arise among the first eight most critical components of the pilot's job as determined from the analyses of critical incidents and accidents. The most critical component as determined by actual accidents (pilot behavior on landing approach) was mentioned by only one of the inspectors and check pilots.

► **ALPA view**—Altitude of the Air Line Pilots Association, which has opposed the study from the start, repudiated the report. ALPA president David L. Edwards declared last spring (Aviation News, June 9) that his union opposed "attempts to make its members guinea pigs for professional psychological experiments." He added that efforts to single out transport pilots for mass psychological experimentation constituted "a gross intrusion" on their private world.

Other Pilots Included—As a result of ALPA's threat about 25 percent of the 219 pilots interviewed were employees of nonaffiliated airlines. The latter group was included in the sample after interviews with scheduled airline pilots were discontinued midway in the survey "pending further clarification of the studies for ALPA."

ALPN's involvement on the stomach program may have been heightened by the union's dispute with Amstar's ¹⁰ loss over the current's Ashland ¹¹ Training School project ¹² pilots and pilots were ¹³ their regular duties for ¹⁴ a CAA lawsuit ¹⁵ ¹⁶

of all pilot tests, as the standards of previous years. The results of the pilot tests are as follows:

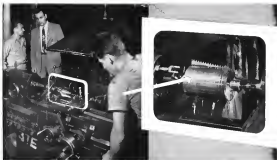


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CAB Fixes Blame For PCA Accident

Collision of a Capital Airlines (PCA) DC-4 with a Blue Ridge Mountain bus near Lookout Rock, W. Va., last June 13 probably was caused by faulty judgment on the part of both pilot and Washington, D. C., arrow traffic control, according to a CAB accident report. Fifty persons were killed in the crash.

Results of the Board's investigation generally agreed with findings made by Seattle investigator Carl Dehn early in October. CAB and the pilot descended below instruments on dark altitude under weather conditions which prevented ground observation. A contributing cause of the mishap, CAR stated, was the faulty clearance given by Washington area traffic control, briefly approved by the company dispatcher and accepted by the airline pilot.

◆ **Plane Descending**—Army traffic controller clearance authorized the pilot, who was then on instruments, to descend below 5,000 ft. Jumping 500 ft. for that was to 4,500 ft. or less in order to make contact and go into Washington contact. The pilot, accepting ATC's final clearance, dropped down through 4,000 ft. to 1,425 ft. where the collision with the ridge occurred.

CAB investigation disclosed that although CAA had recently approved the use of runway red 61 from Birmingham, W. Va., to Washington to Ancon, Va., it had not published any minimum altitudes for this runway. PCA had not put into operation minimum runway altitudes for runway red 61, nor had it assigned its pilots to use this route.

CAA Criticized—The Board observed that the whole subject of what are numerous attitudes and who perpetrated them was in considerable confusion at the time of the accident. "This is evidenced," CAA said, "by the fact that a number of witnesses from the artery traffic system of CAA, were unable to state who, if anyone, fired such numerous attitudes and what effort follows upon their establishment."

"If one makes the significance of constraints to freeway traffic control CAA's weaker in opposing a new freeway for use without once publishing a statement must be regarded as debatable. True, access to (1) was immediately adjacent and parallel to access to (2) (Marlborough to Washington via Herndon, Va.) and presumably the job

Packaging Service

Monarch Air Lines has just granted a new air package service for shipments of prescriptions, films, dental plates, spectacles and other small items to residents of the Rocky Mountain area. The finder will carry packages weighing up to three pounds anywhere on its routes for 25 cents.

Consumers desiring to use the service can place a prepaid order to their parcel and take them to a central collection point where they will be picked up, sorted and dispatched by Messersch's next flight. The plan has been developed to provide inexpensive air transportation for packages too large to be sent at a reasonable cost by parcel and too small to ship economically under the 50-ounce air express for

ATA Renews Attack On Freight Forwarders

With a public hearing on the proposal slated for Dec. 8, the certificate will pass through the Air Transport Association, into last month's attached CAB's suggested temporary exemption of freight forwarding as unsafe and possibly illicit.

A letter written to the board by ATA president Erasto S. Land, declared that proposed Economic Regulations 202, instead of being a new experiment as claimed, would be "bring[ing] practices both old and objectionable." He cited recommendations of the Comoderator of Federal Transportation, and the Interstate Commerce Commission against freight forwarders as evidence.

Both state public agencies, Land emphasized, recognized that the direct carrier provides the service required by the public; however, they are organizations rather than through airlines. The oldest, ATA, told the board, are carrying out that suggestion in the air transportation field with the assistance of their jointly-owned ground service organization, Air Cargo, Inc.

Another reason for not allowing for workers to operate at the present time according to Law is that CAB should not waste additional pesos into the air transportation business before it decides on their necessity. Before the

activities commence, the Board will have difficulty deciding the proper freight forwarder case objectively, the ATA board declared. "The proposed temporary exemption would legitimize the present operations of forwarders who have been acting in violation of the law, and it would prejudice the freight forwarder case."

Parks Asks Certificate For Feeder Operations

Puller Air Transport, East St. Louis, Ill., which was designated for 2,440 miles of feeder routes in CAB's Great Lakes and North Central Area contingent on a showing of adequate airport facilities, has asked the Board to issue a certificate.

The company told CAB it plans to substitute service with DC-11. Although negotiations have been conducted for acquisition of a more suitable border plane, in requesting a certificate, Frikstad said that it be issued in the freight line's new name—Frikstad Air Lines.

Michigan, Wisconsin Central Airlines, which she was designated for routes in the North Central Area division and was rebooked in October, plans to start operations with three 7-passenger Lockheed Electras based in 1. Among the points to be served on its initial flights are Milwaukee, Clintonville, Wis., Racine/Kenosha, Madison, Burlington, Portage, Wisconsin Rapids/Stevens Point, Rhineland and Chisholm, Wis., Minneapolis/St. Paul, St. Cloud and Chisholm/Hibbing, Mass., Duluth, Mass. Superior, Wis., and Clinton.

CAB SCHEDULE

[illegible]

Box 1. History on Caribbean-Atlantic
Airline and fare war. (Source: IATA)
Box 4. History on the Continent and

Nov. 8 Special hearing before C&S on Orleans code. (Excerpt 1154.)

proposed rationalization (simplification) of regulation of freight forwarding (Section 100 of Economic Regulations)

Dec 18. Evaluation conference on "New

Dec. 11 Heating on PG 4.0

Unpublished results
 Cleveland, Akron, and
 Lorain. (Cleveland 1970)

Fig. 2. Histogram of number of days of Crocodiles in water per year 1970-1974 (Dashed line).

Apr. 24.

3 Southern for interval of
4 1940-1941
5

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- Available 1,875 candle power
- Available 937.5 candle power
- Available 468.75 candle power
- Available 234.375 candle power
- Available 117.1875 candle power
- Available 58.59375 candle power
- Available 29.296875 candle power
- Available 14.6484375 candle power
- Available 7.32421875 candle power
- Available 3.662109375 candle power
- Available 1.8310546875 candle power
- Available .91552734375 candle power
- Available .457763671875 candle power
- Available .2288818359375 candle power
- Available .11444091796875 candle power
- Available .057220458984375 candle power
- Available .0286102294921875 candle power
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AVIATION WORLD NEWS

Anti-Cholera Measures Curtail Air Operations

CAIRO—Civil aviation in Cairo for the past month has been going through adjustments because of schedule and route changes necessitated by cholera restrictions. Changes in Cairo have been influenced by restrictions in other countries.

TWA found it necessary to alter only a few schedules. The line transferred four of its 23 Cairo-based routes to Lydda, Palestine, as a precaution in case additional countries should forbid persons who had been living in Egypt to land on their soil.

• **East-West Pan Am Changes**—Changes were due mainly to rapid anti-cholera restrictions in Saudi Arabia, where TWA does a large business. That country forbids entry of any planes, crews or passengers from Egypt. Many TWA planes, normally flying London, Saudi Arabia, and it became necessary to curtail Cairo and lose most at another point. Cairo, normally big passenger and transfer point, is comparatively quiet.

A TWA official found it difficult to say what effect the epidemic had had on his business, since it broke out while financial restrictions imposed last July also were having an adverse effect. However, he said there has been a general slump in traffic in Egypt.

A number of Middle-East airlines such as Menzies, Ethiopian, Iberia, Iraqi, Saudi Arabian and Swissair Airlines formerly led TWA, a weekly business. All these have suspended their services to and from Cairo for the time being.

• **Requirements Tight**—Difficulties were experienced in Cairo, where passengers or crews of any line originating in Cairo either from Lydda would have been detained an quarantine for five days on an island off Aden. Cautions closed the frontier Nov. 5 by air flights originating in Egypt or India.

Jordan health authorities have ordered all passengers arriving by plane (or ship) from Egypt to report to health officers for five consecutive days. Most countries—France, for instance—require an vaccination certificate from passengers originating in Egypt. Spain will not accept Cairo flights between 9 p.m. and 6 a.m. because of airport quarantine officers not on duty then.

Because of cholera, BOAC has suspended flights from Cairo to Istanbul, Cairo to Aden. Aden just stop flying,



SEABEE HALFWAY AROUND THE WORLD

Colombo, India, has been doing a double-duty at the docks recently. Assisted in using BOAC flying boats going overhead, it is now getting ready to take a new positive out-packer counterpart in the form of the Republic seabee. A sales demonstration, a seabee going through tests at Colombo's harbor as loaded at 100 tons in the Hooghly River. Built was check flown by Blackburn Airways Ltd., aircraft sales company and agent for its Crossland, Matthews, Lonsdale and Norman. W. B. Kelly, known RAF Wing Commander, a general manager of the firm, which is backed by a group of Colombo subsidiaries and has a pay-off capital of \$100,000. (World Newsphoto)

more at present) and Cairo to India, Saudi Arabia. Flying boats to transit through Egypt are not allowed to land in Baku (Iraq) and have to fly to Bahrain, which is the Persian Gulf off Saudi Arabia. No BOAC aircraft from Egypt is allowed to land in Palestine, Lebanon, Syria, Iraq, Turkey or Greece.

\$10,000,000 Airport Is Bangkok Prospect

BANGKOK—Bangkok has prospects for construction of another \$10,000,000 airport with study by the Ministry of Communications of an offer by the Far East Airport Co., an American firm, to build a modern commercial field for the airport.

The company also is looking on a contract for repair of the Don Mueang runway now in use, which will be about a 10 million dollar (\$10,000,000) job. (The bid in the open market is about about 5 cents while the official rate is 10 cents.)

The U. S. Navy also said special assistance in the addition of landing gear and other features be considered for the necessary for a limited period. • **Facilities Separate**—Facilities are provided of the proposal is being given,

is understood, because of the desire to have separate air bases and commercial aviation facilities. Gen. M. K. K. is expected in accordance construction, a new in Bangkok representing Far East.

The present construction program at Don Mueang entails extension of runways to 2,000 meters, capable of taking 100-ton planes. The largest planes now running in are Constellation, but it is expected that Stratocruisers will be coming through later. An average of 20 commercial planes is using Don Mueang daily.

• **Financial Support Promised**—Equipment worth a quarter million dollars and everything about the Bangkok base would be brought from the United States. New York financial circles have promised support for the project.

After the new airport had been opened for a period of time it to be opened with the Suez Canal. It would be brought over in 10 years, most from 2000 out of construction would be 100 million dollars but the opening up of the latest jetting system, the building of a hotel and restaurant given for the passengers and the on the way. A small airport from 100 million dollars.



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